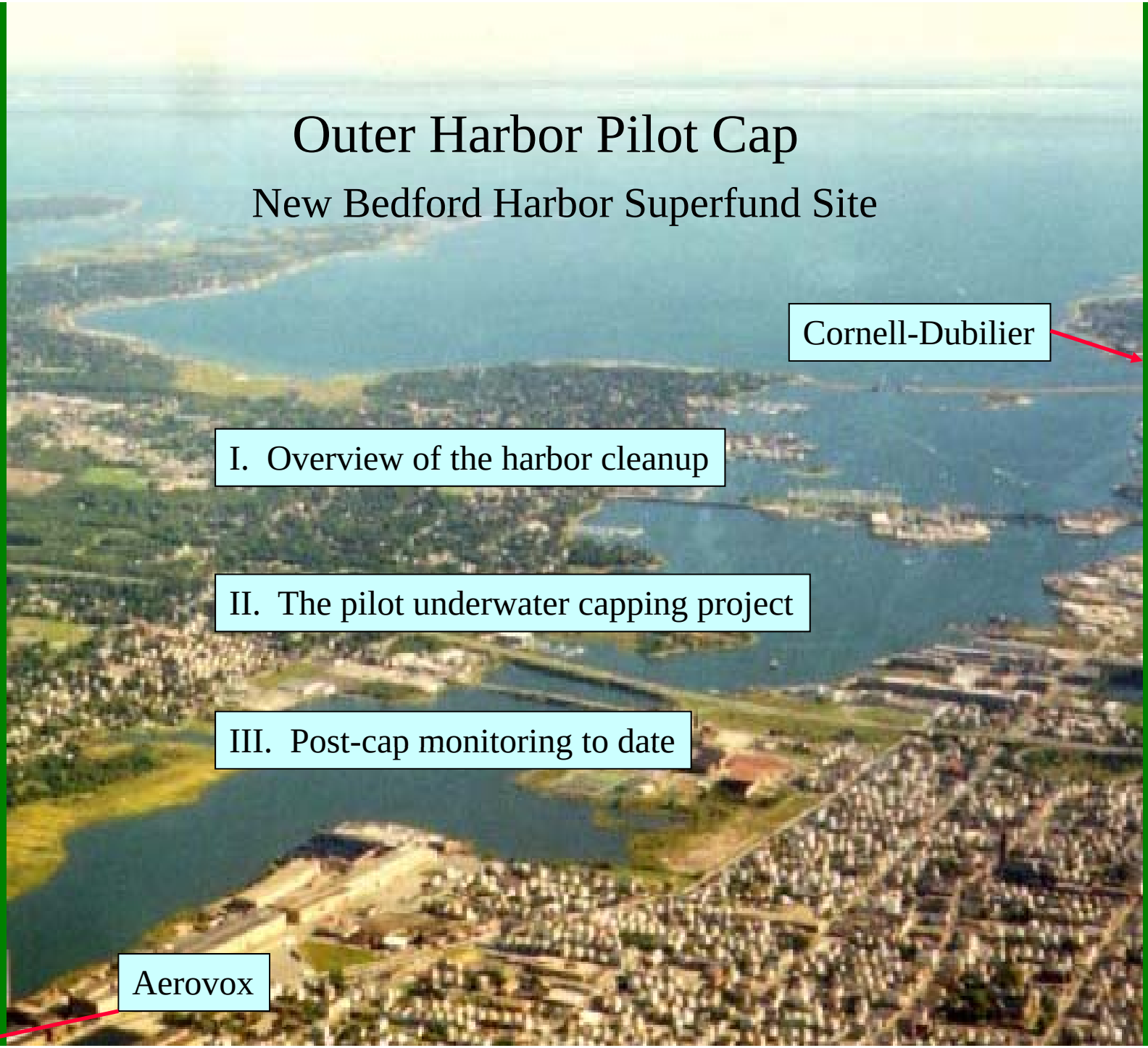
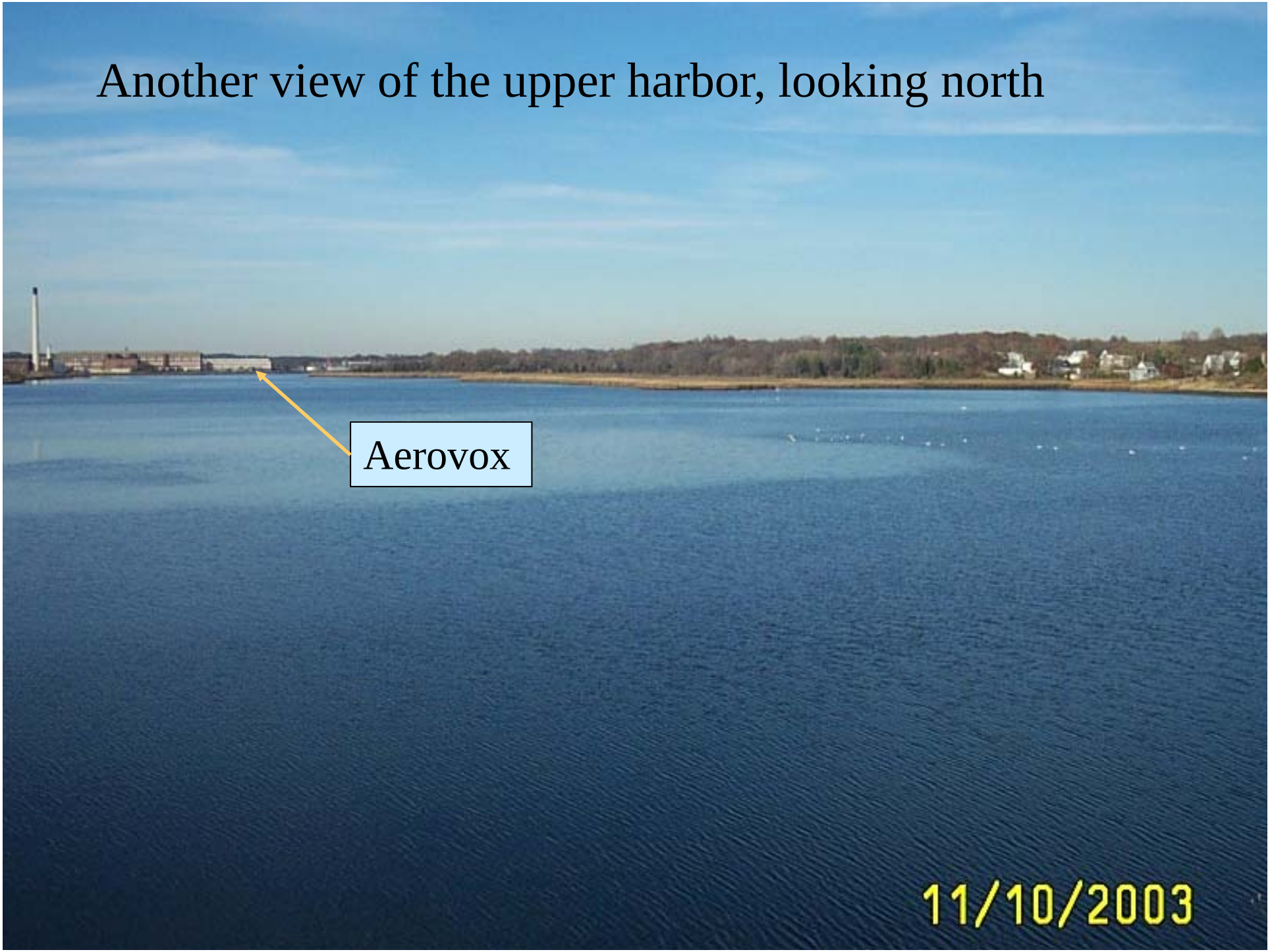
# Outer Harbor Pilot Cap

## New Bedford Harbor Superfund Site



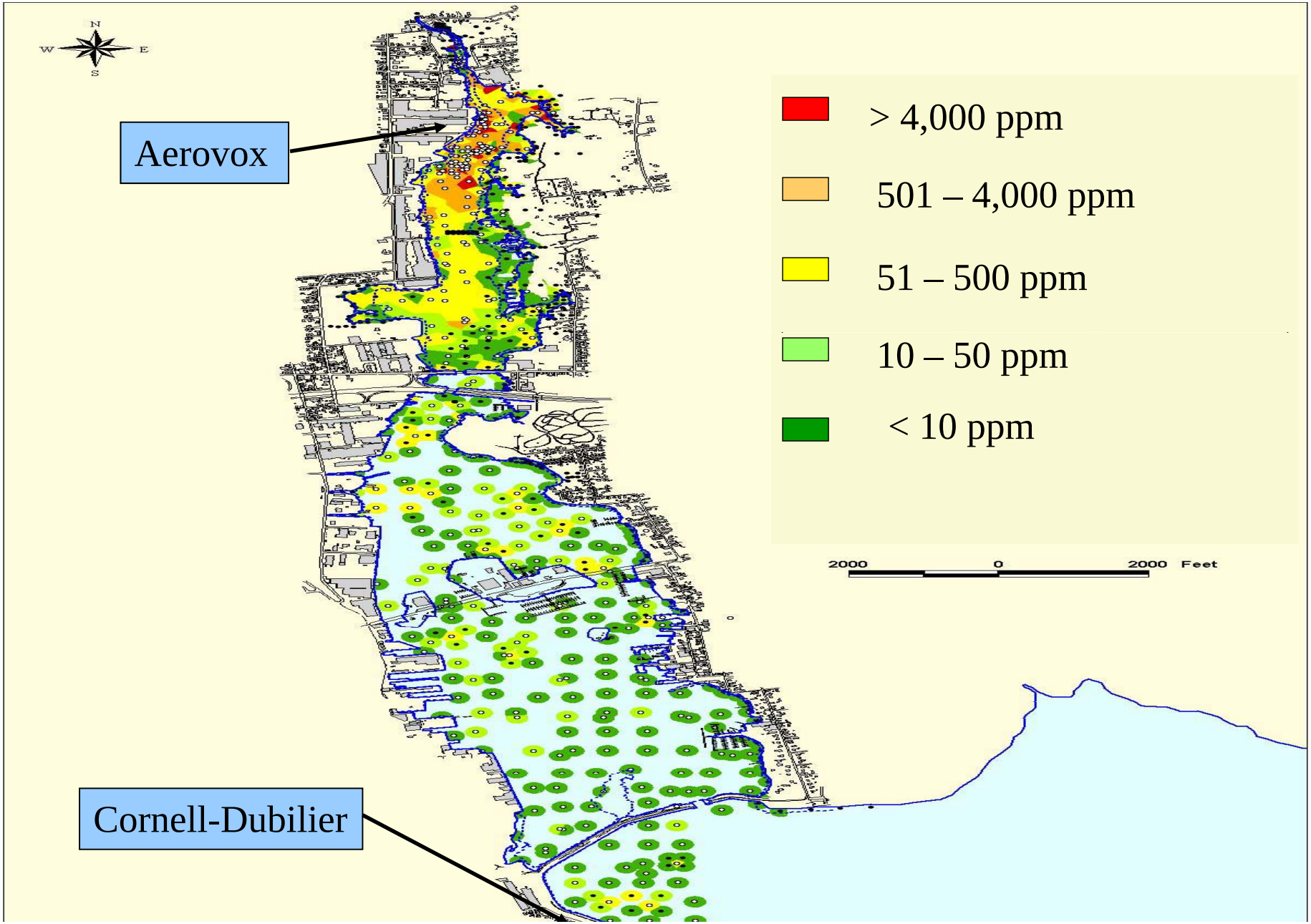

Another view of the harbor - looking south

# Some key features

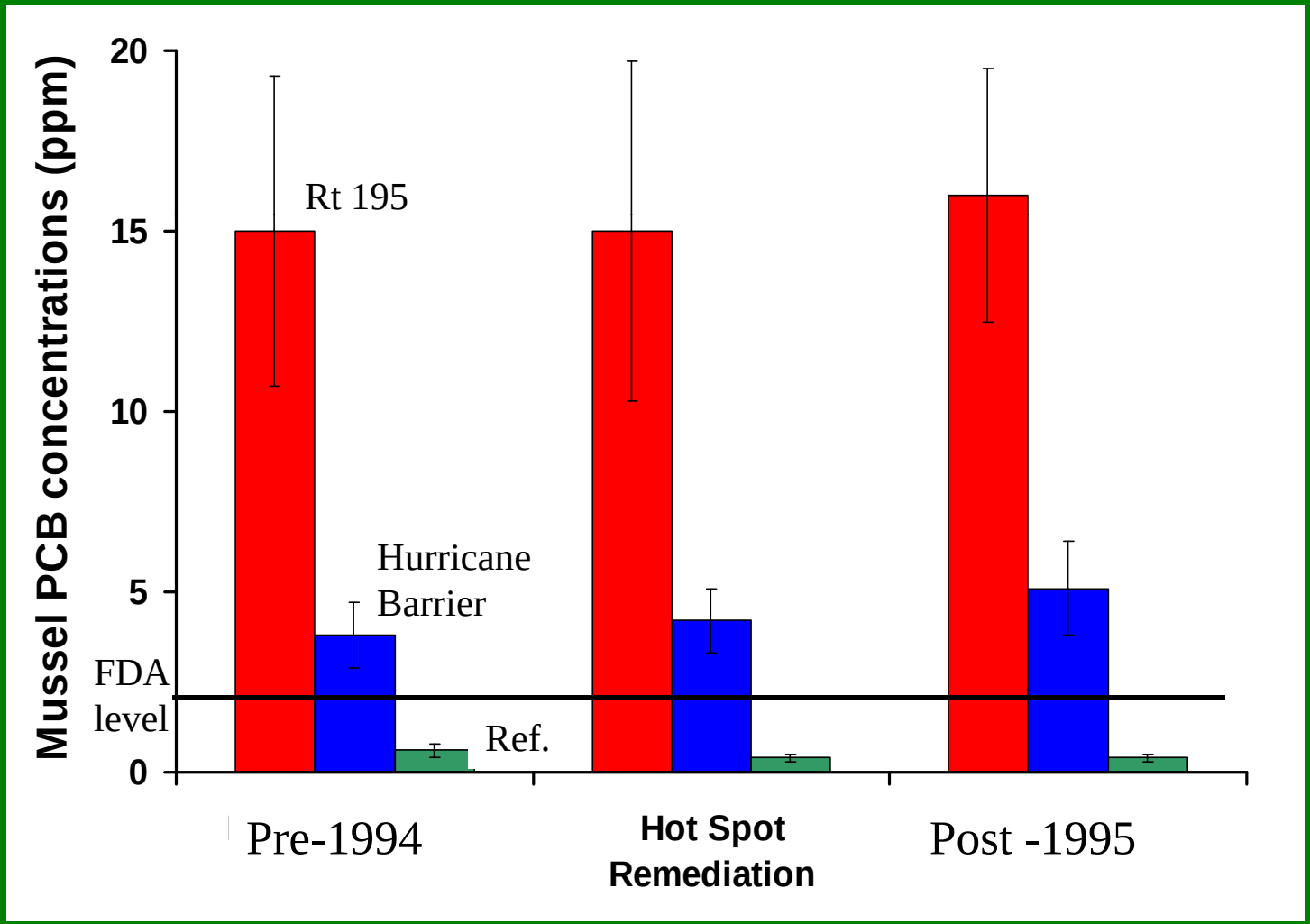

Another view of the upper harbor, looking north
Aerovox
11/10/2003

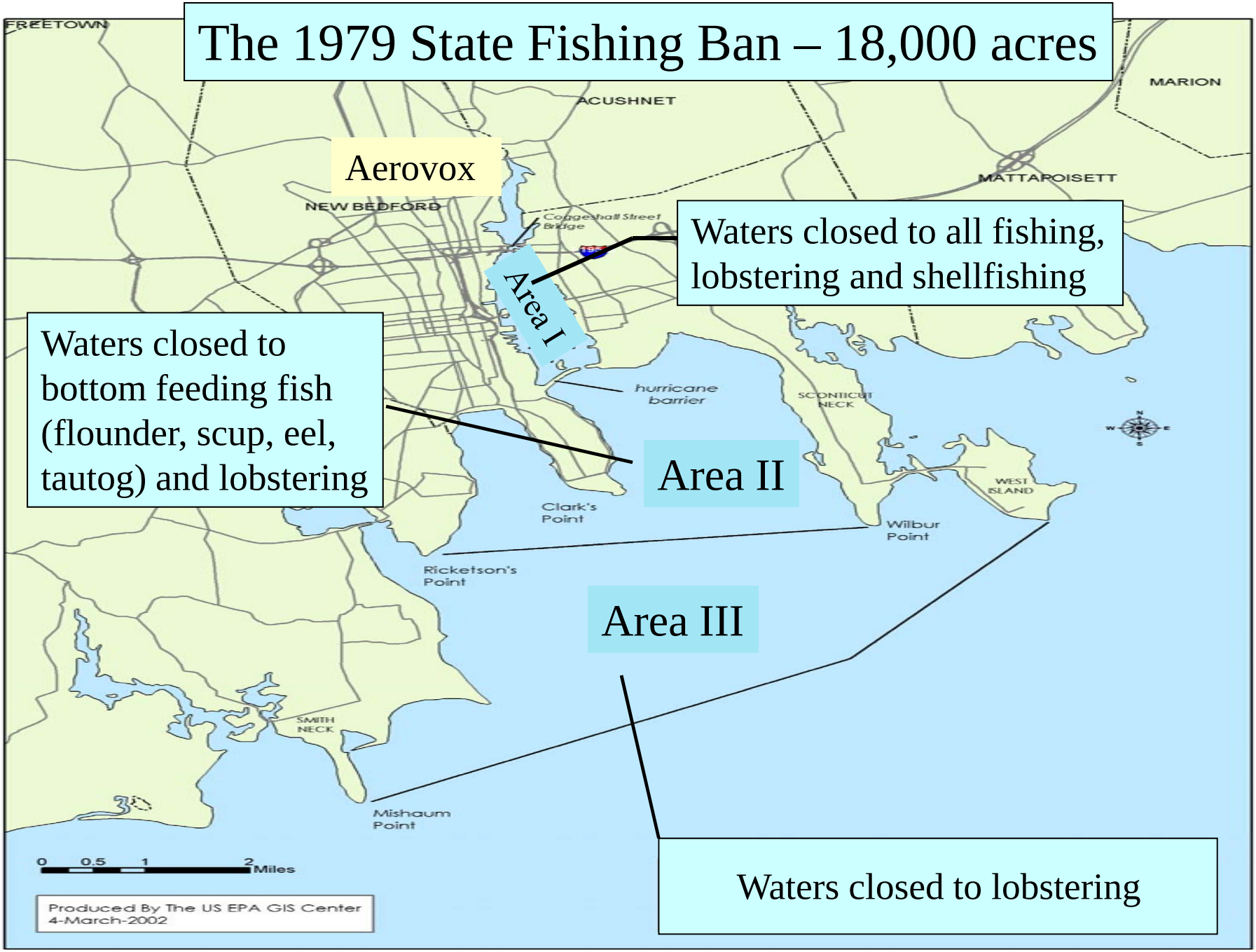
The lower harbor – largest fishing port in US ($-wise)

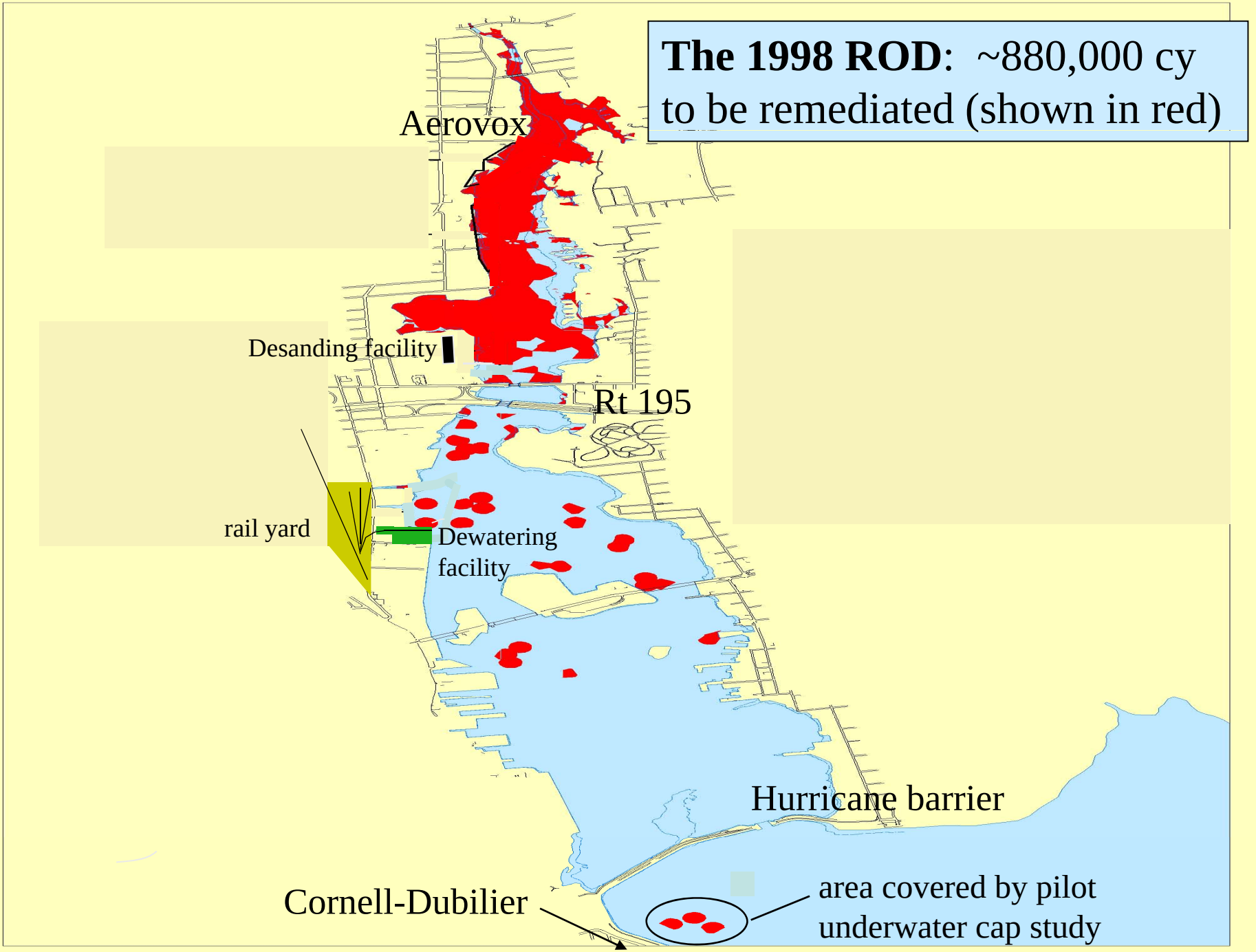
# PCBs in sediment – top foot



# PCBs in Blue Mussels - Above FDA




The 1979 State Fishing Ban – 18,000 acres
FREETOWN
ACUSHNET
MARION
MATTAPOISETT
NEW BEDFORD
Coggeshall Street Bridge
Aerovox
Waters closed to all fishing, lobstering and shellfishing
Area I
Waters closed to bottom feeding fish (flounder, scup, eel, tautog) and lobstering
hurricane barrier
SCONTICUT NECK
Area II
WEST ISLAND
Clark's Point
Wilbur Point
Ricketson's Point
Area III
SMITH NECK
Mishaum Point
0 0.5 1 2 Miles
Produced By The US EPA GIS Center
4-March-2002
Waters closed to lobstering


**The 1998 ROD**: ~880,000 cy to be remediated (shown in red)
Aerovox
Desanding facility
Rt 195
rail yard
Dewatering facility
Hurricane barrier
Cornell-Dubilier
area covered by pilot underwater cap study

# Sediment cleanup levels in the 1998 ou1 ROD:

Dependent on area and land use:

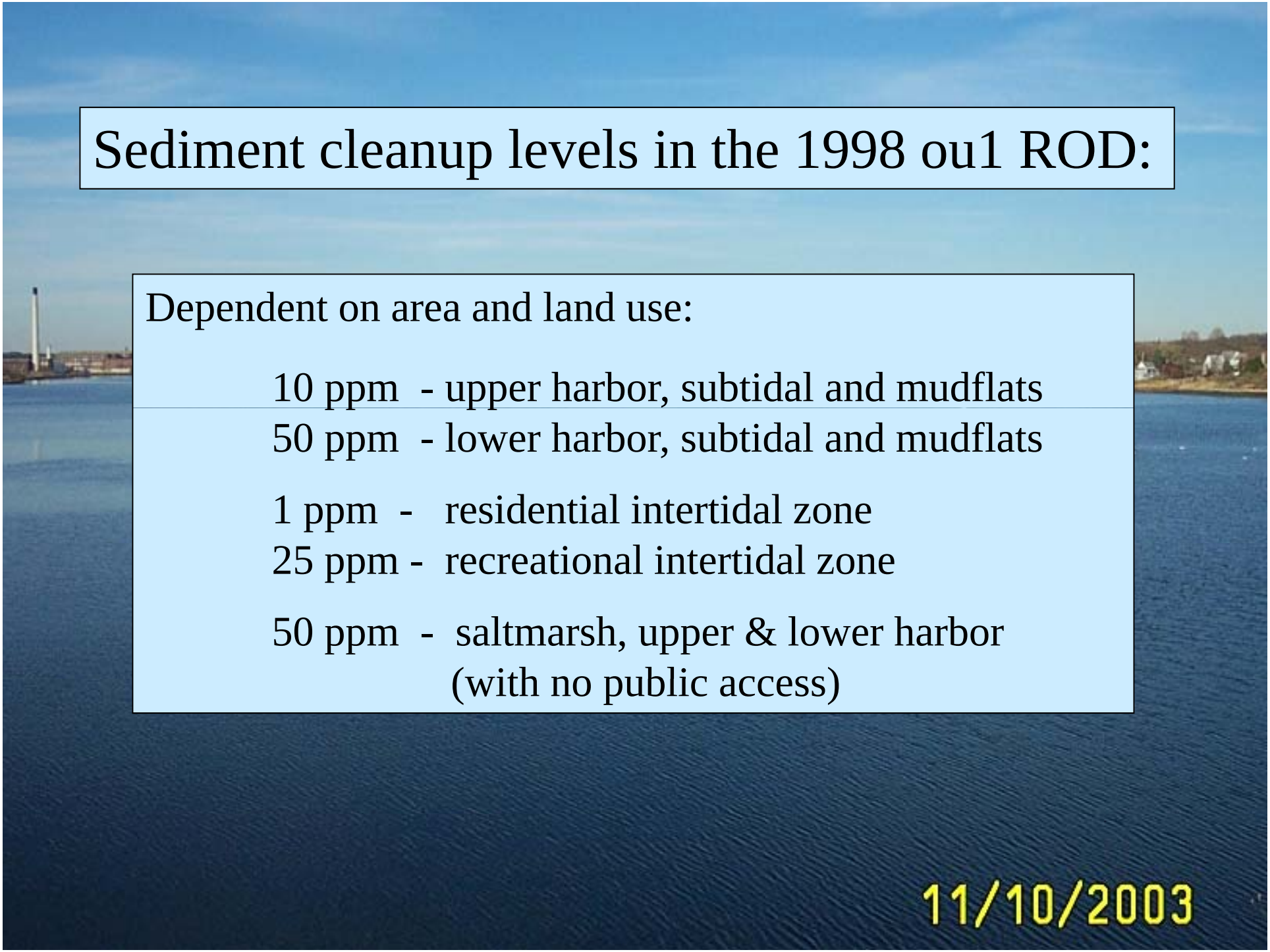
10 ppm - upper harbor, subtidal and mudflats

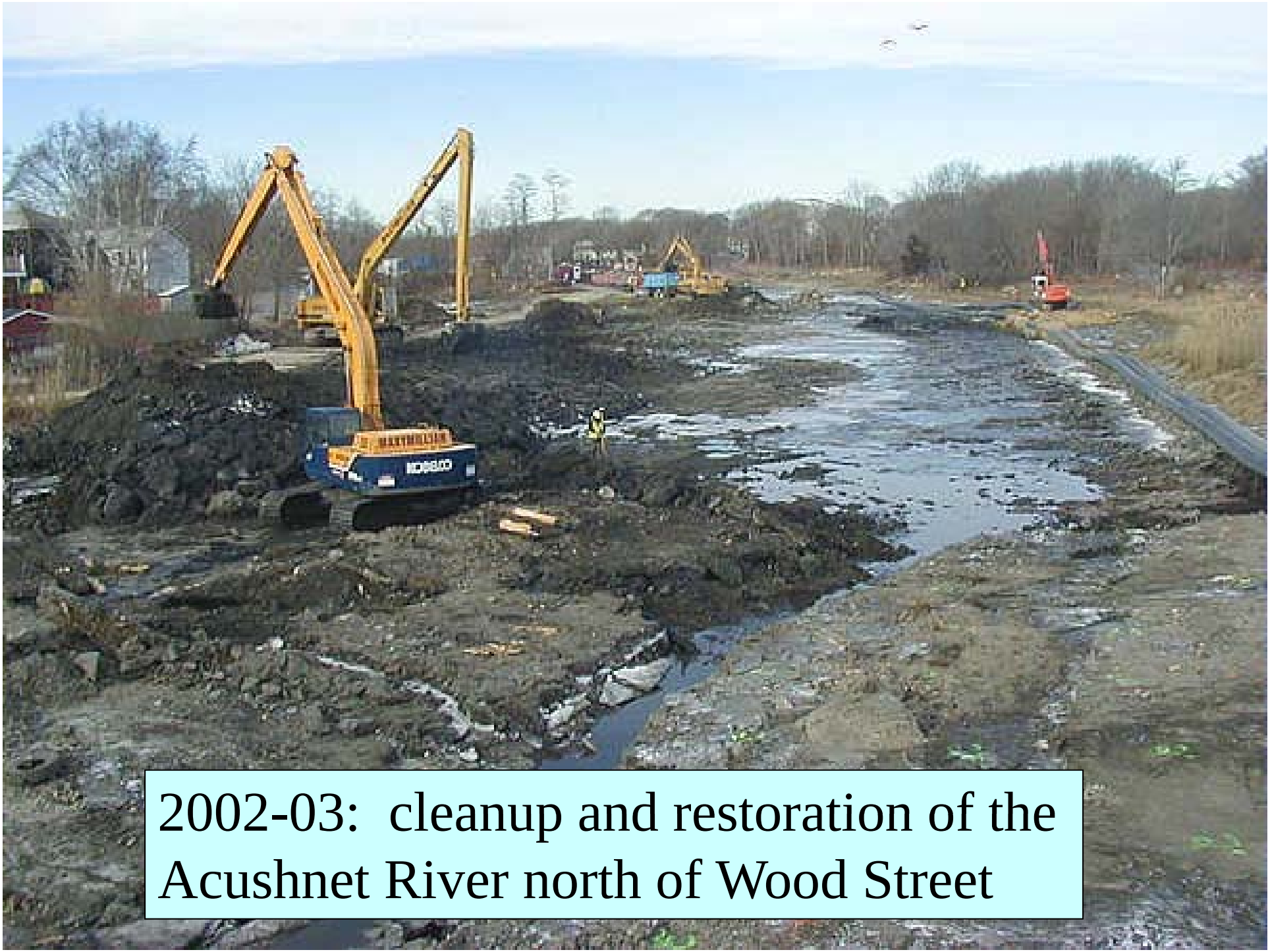
50 ppm - lower harbor, subtidal and mudflats

1 ppm - residential intertidal zone

25 ppm - recreational intertidal zone

50 ppm - saltmarsh, upper & lower harbor (with no public access)





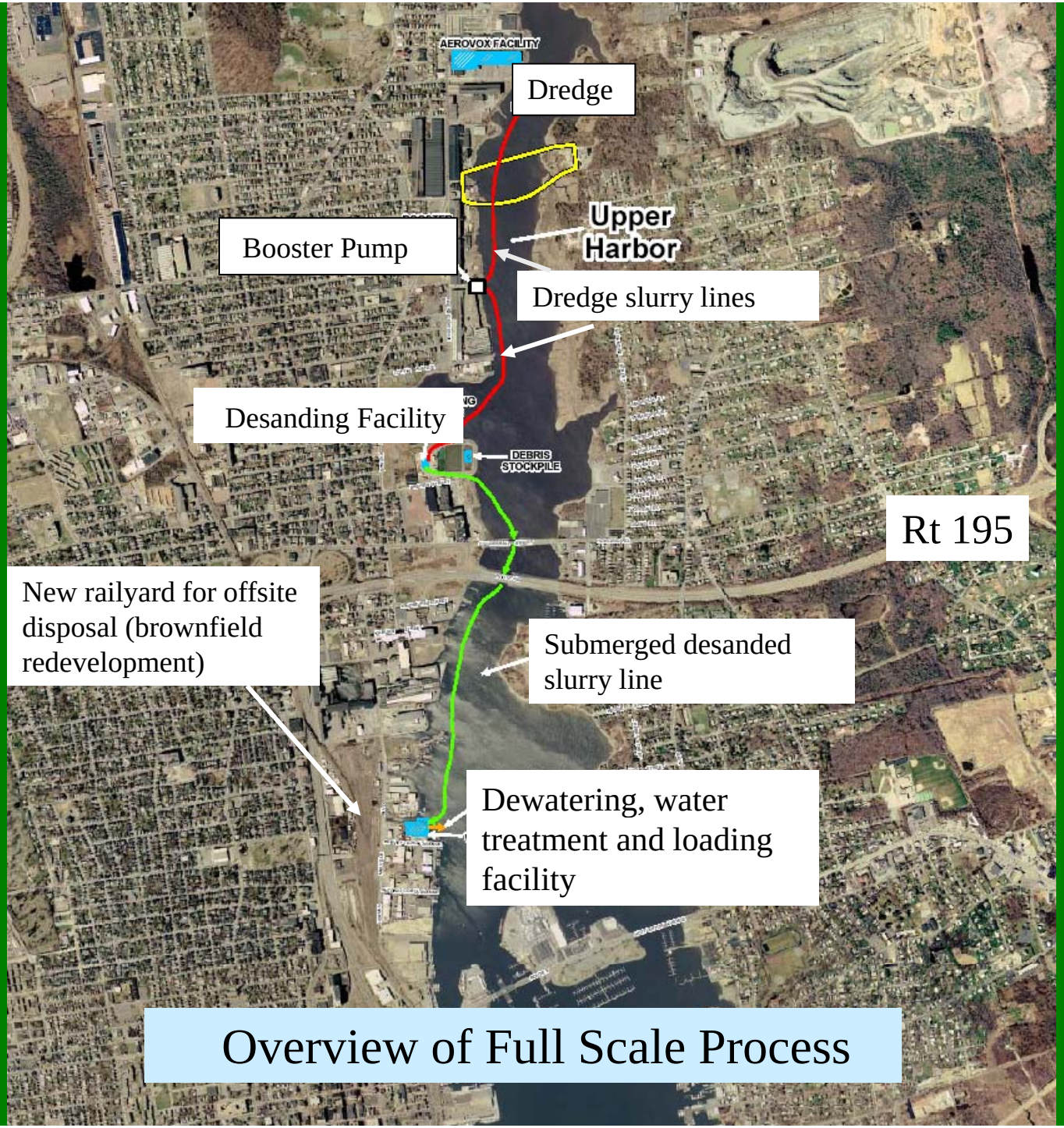
2002-03: cleanup and restoration of the Acushnet River north of Wood Street


Flow restored and saltmarsh planted (low tide)
Future location of city park
(brownfield redevelopment)

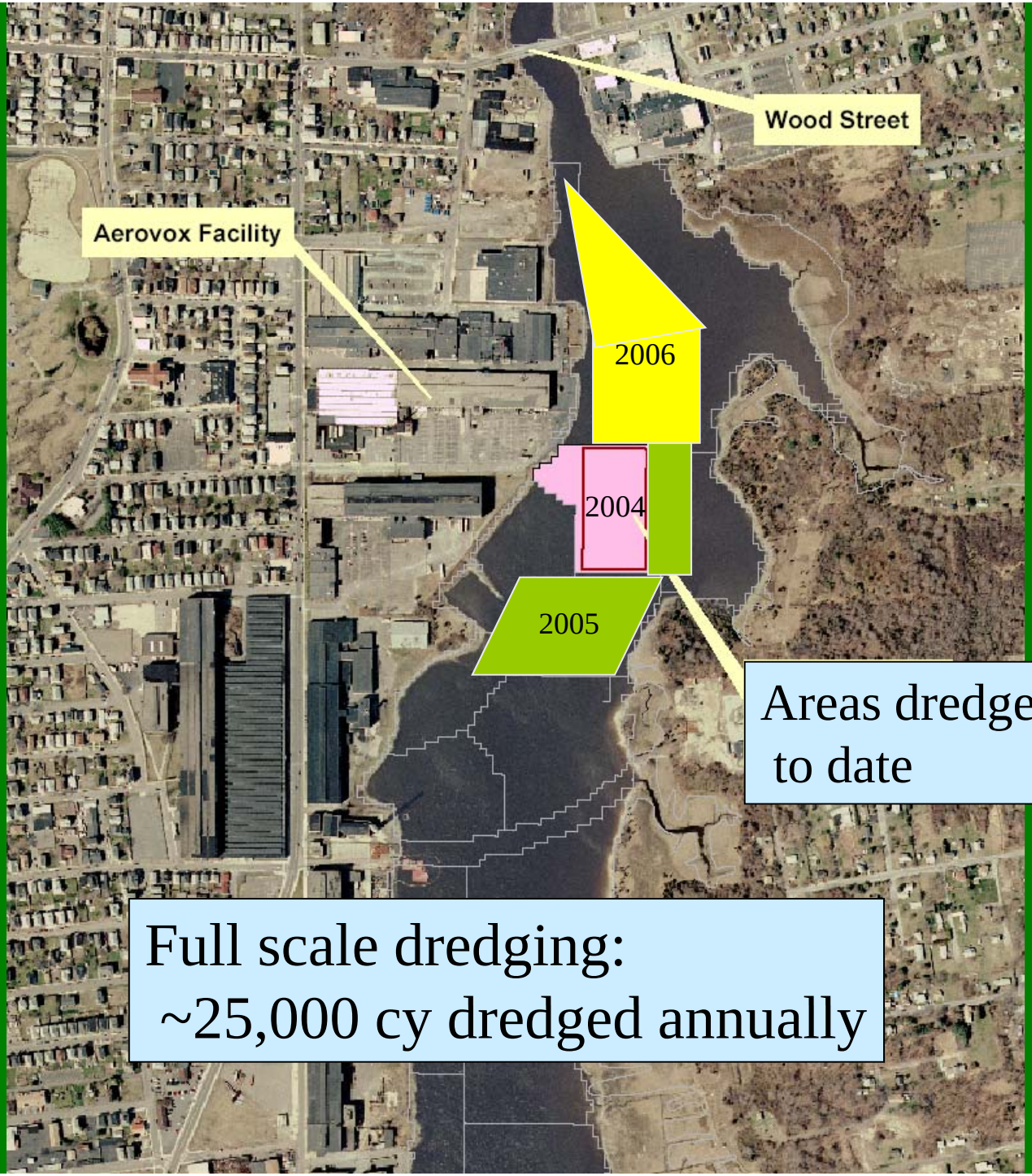
# Full scale dredging operations started in August 2004


Seven-step process:

- Debris removal
- Dredging
- Booster pump/ferric sulfate addition
- Desanding
- Dewatering
- Water treatment
- Offsite disposal of filter cake



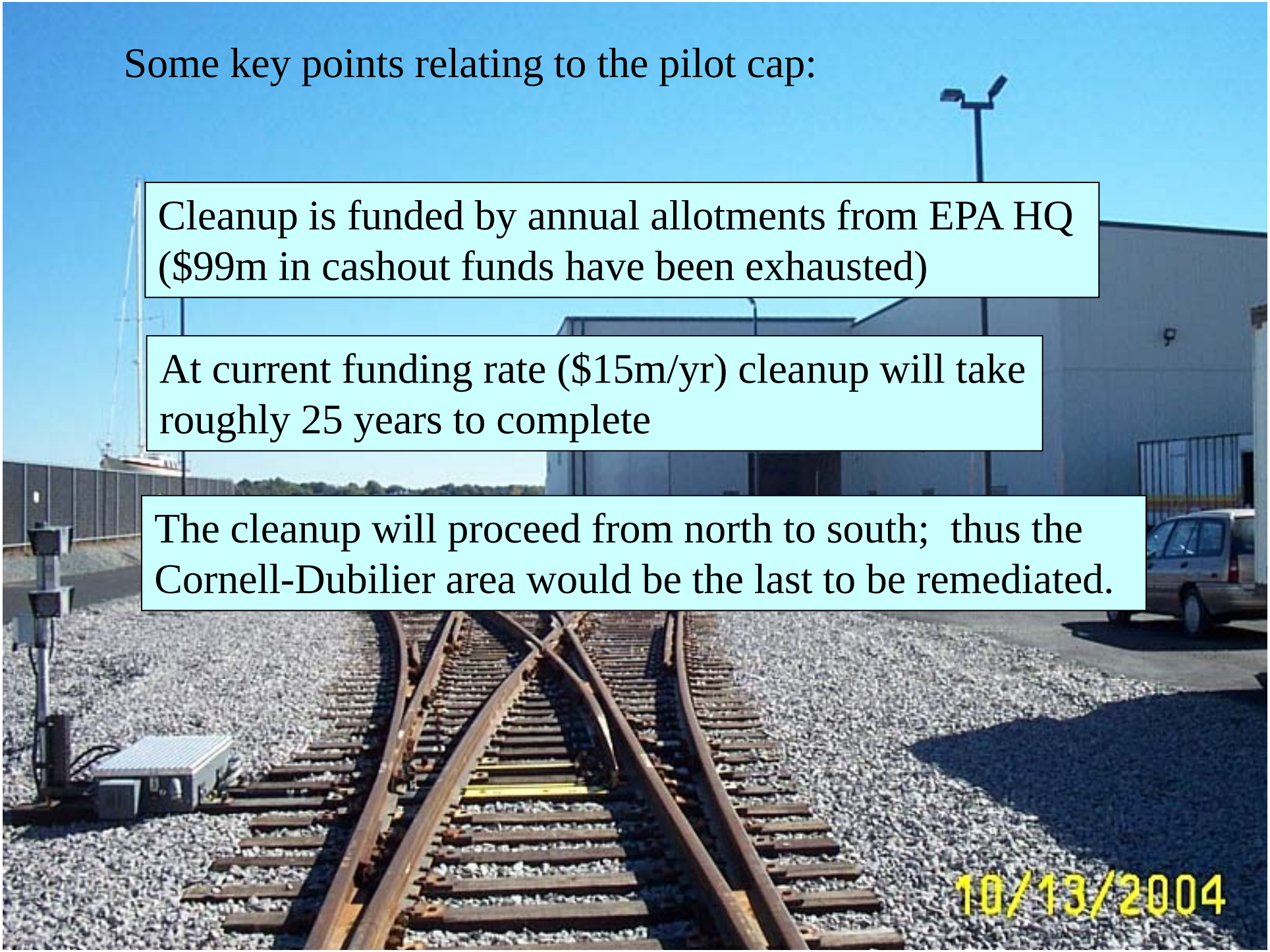

# Overview of Full Scale Process


Wood Street
Aerovox Facility
2006
2004
2005
Areas dredged to date
Full scale dredging:
~25,000 cy dredged annually

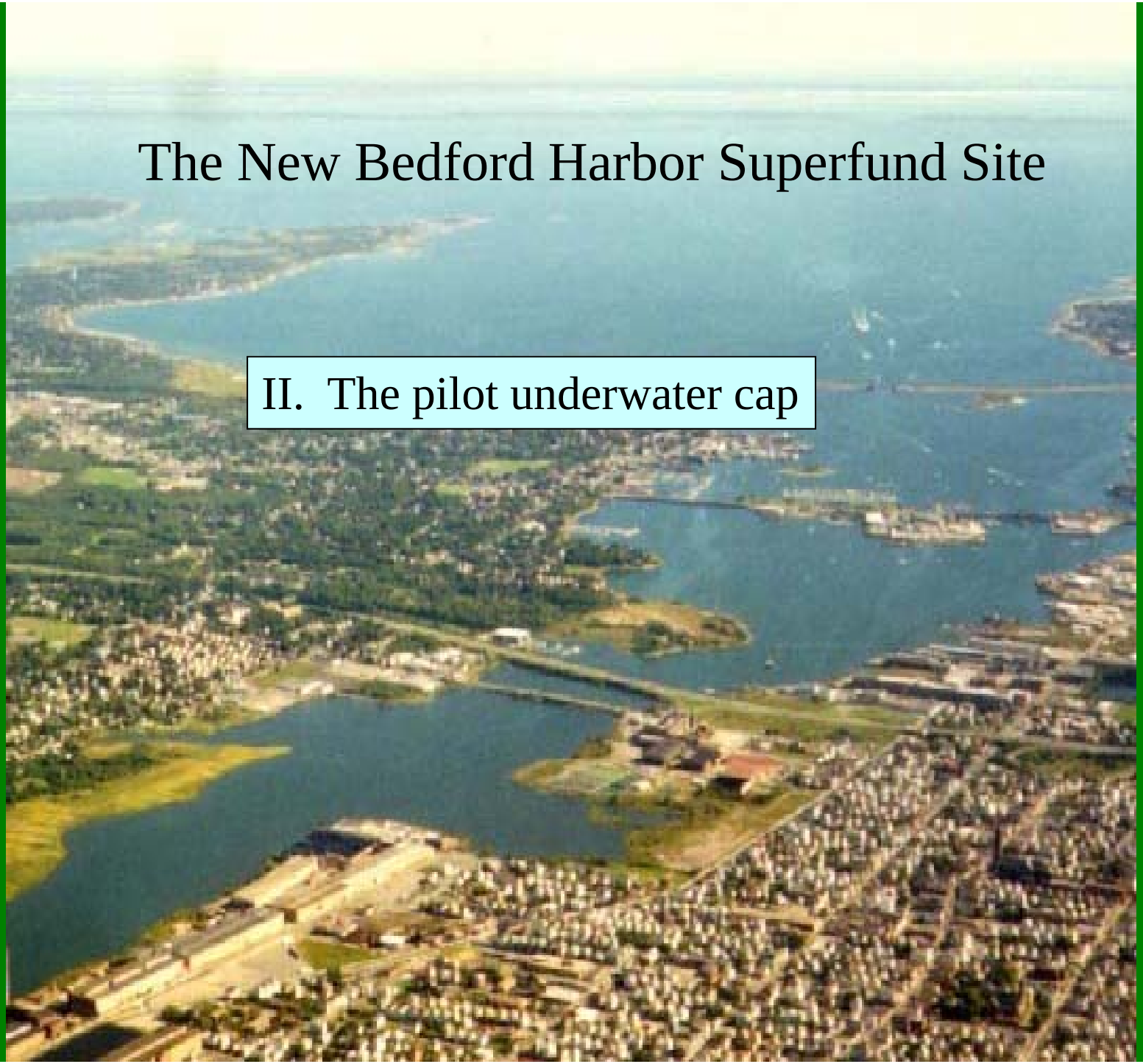

Step 1: dredging…


…Step 7: loading filter cake into a rail car inside the dewatering building

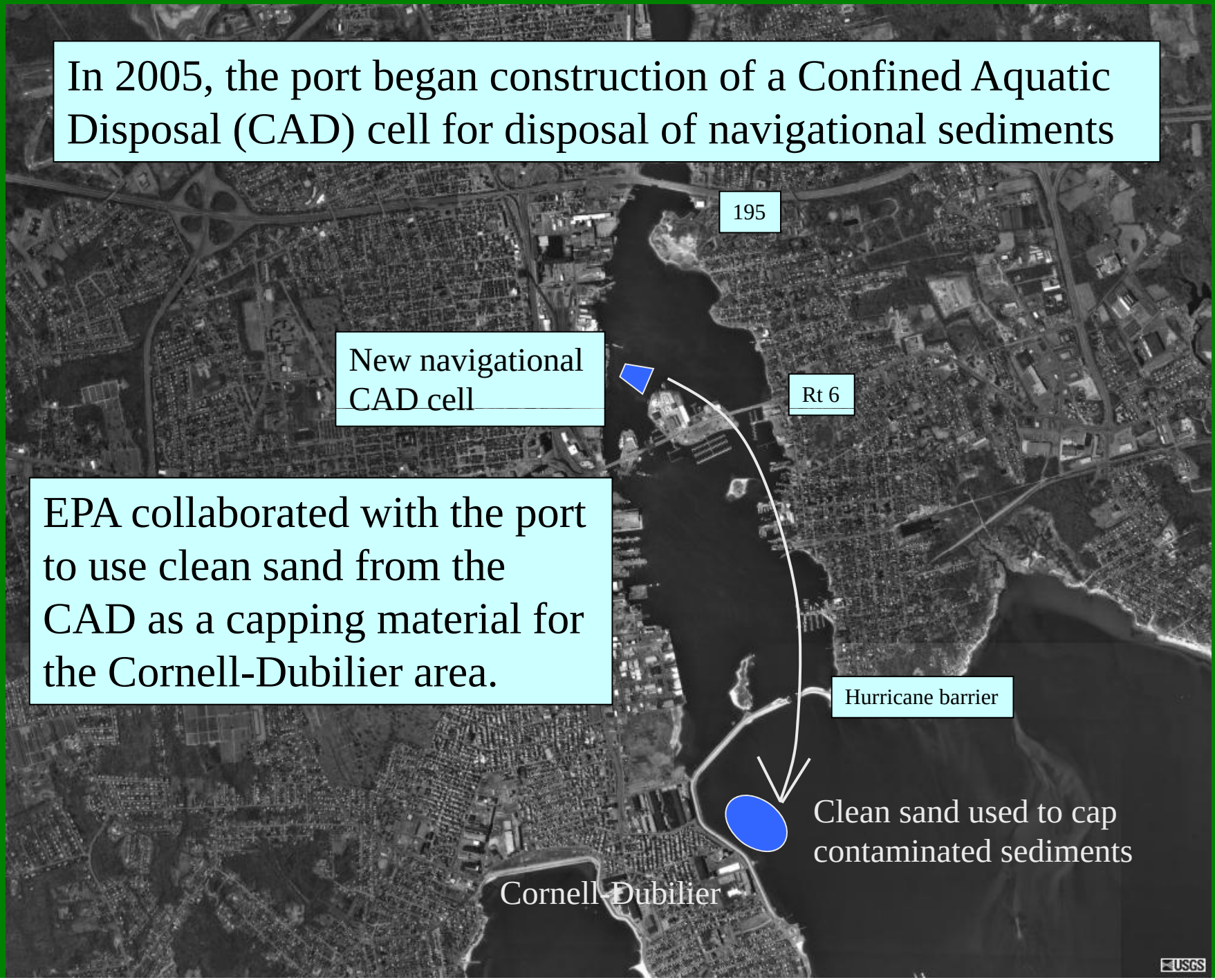
Empty rail cars staged at the new city rail yard


Some key points relating to the pilot cap:
Cleanup is funded by annual allotments from EPA HQ ($99m in cashout funds have been exhausted)
At current funding rate ($15m/yr) cleanup will take roughly 25 years to complete
The cleanup will proceed from north to south; thus the Cornell-Dubilier area would be the last to be remediated.
10/13/2004

# The New Bedford Harbor Superfund Site

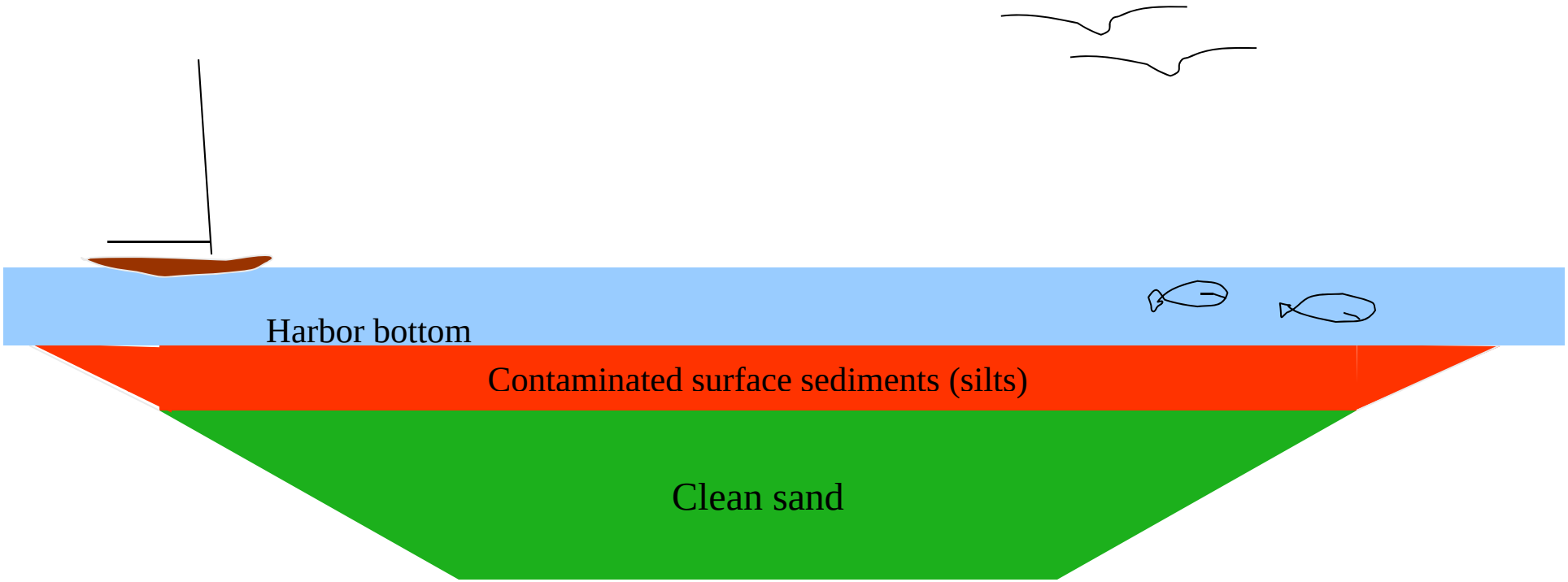


## II. The pilot underwater cap

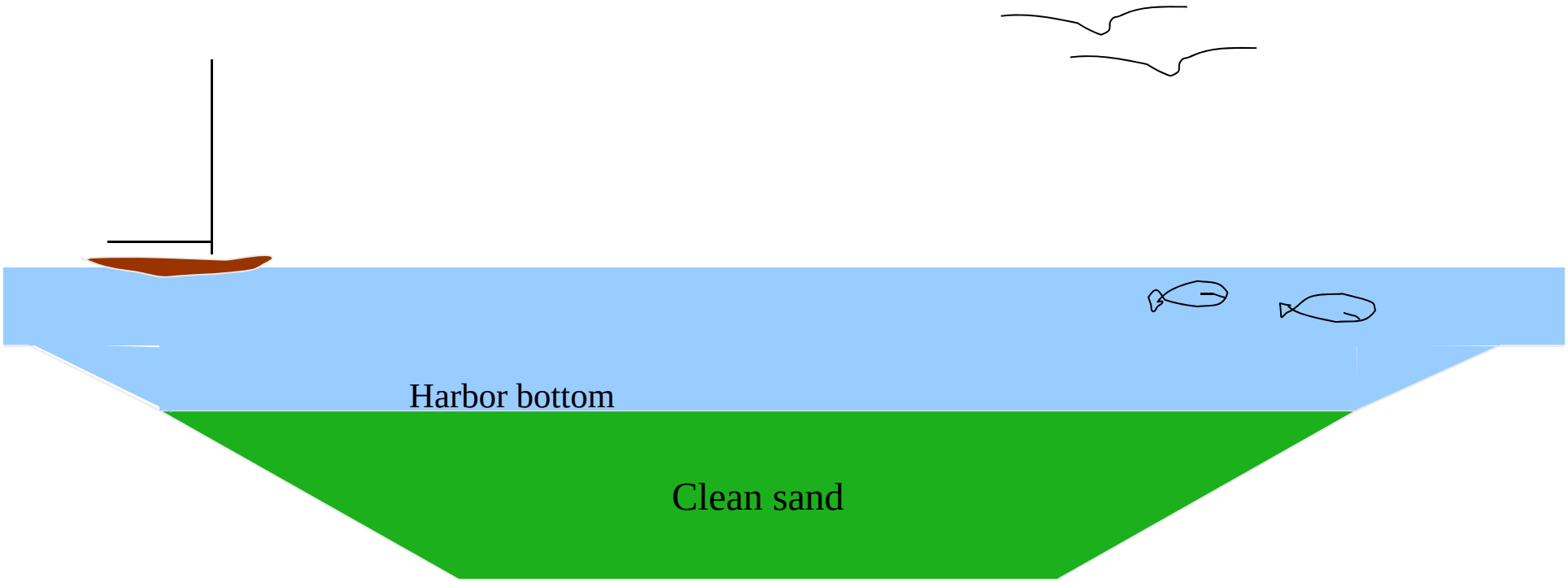

In 2005, the port began construction of a Confined Aquatic Disposal (CAD) cell for disposal of navigational sediments
195
New navigational CAD cell
Rt 6
EPA collaborated with the port to use clean sand from the CAD as a capping material for the Cornell-Dubilier area.
Hurricane barrier
Clean sand used to cap contaminated sediments
Cornell-Dubilier
USGS


Major benefits of the pilot:
1. Cleanup accelerated by: ~25 years
2. Cost to EPA: $0.00
195
Rt 6
Hurricane barrier
Clean sand used to cap contaminated sediments
Cornell-Dubilier
USGS

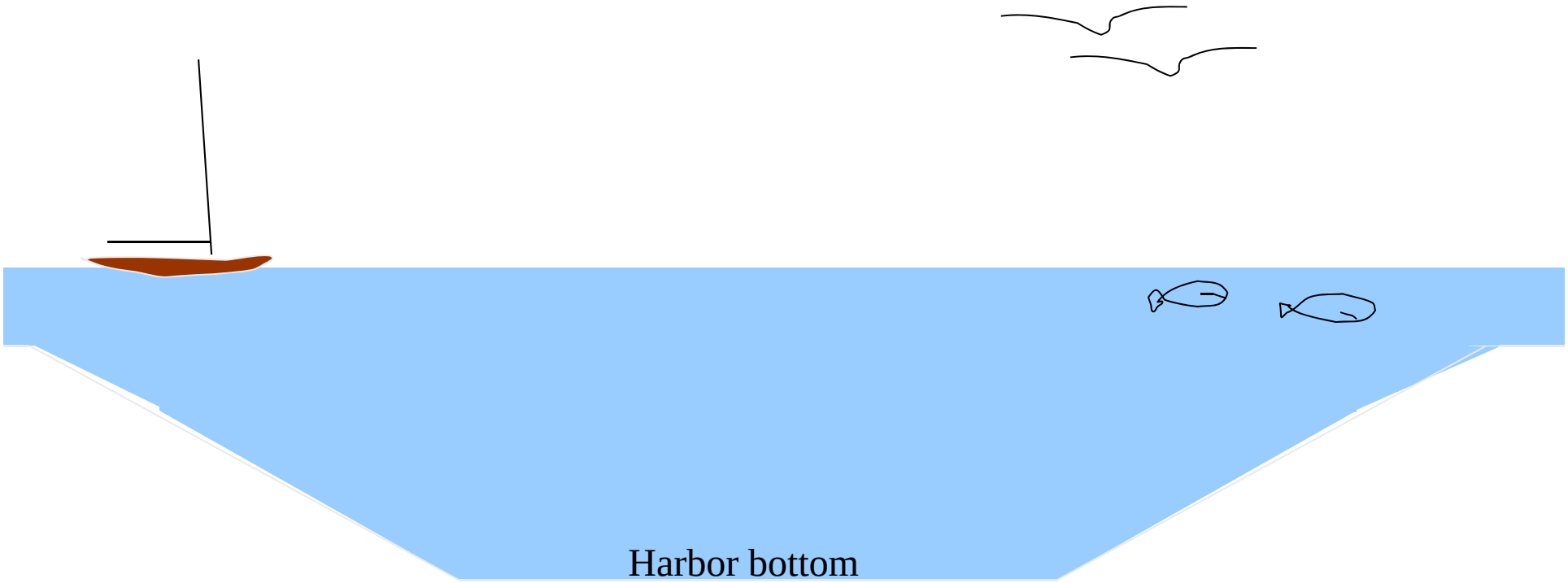
Next:  a series of slides used at public meetings to explain what a CAD is and how it is constructed…




**As is**: New Bedford Harbor

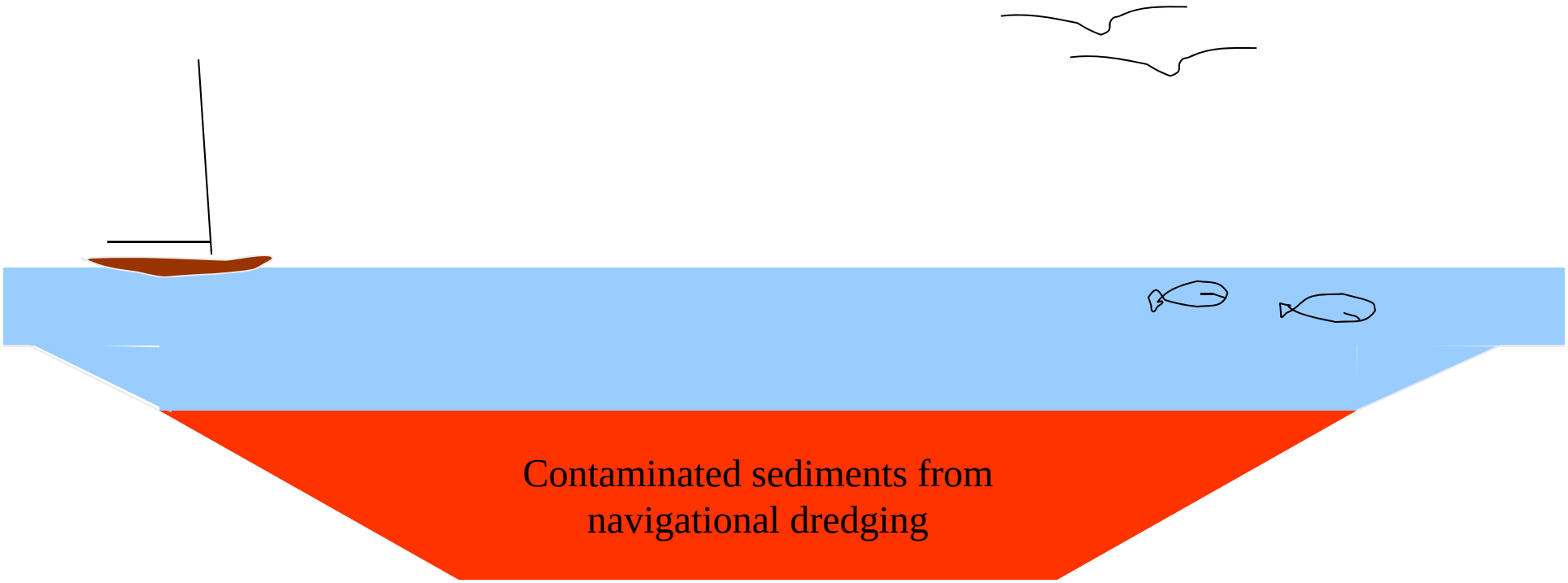



**Step 1**: the contaminated surface sediments are removed

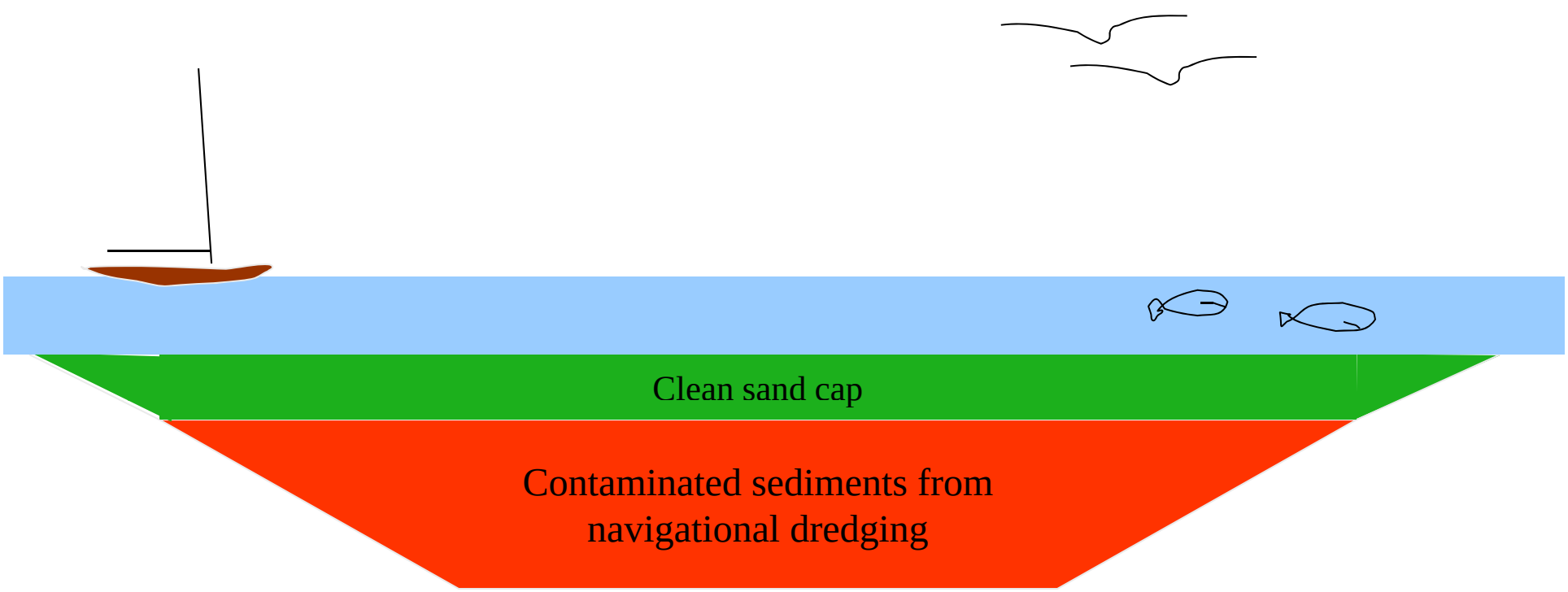



**Step 2:** the underlying clean sand is removed

Note: this is the material used for the pilot cap




**Step 3:** the CAD is filled with contaminated sediments from navigational dredging.

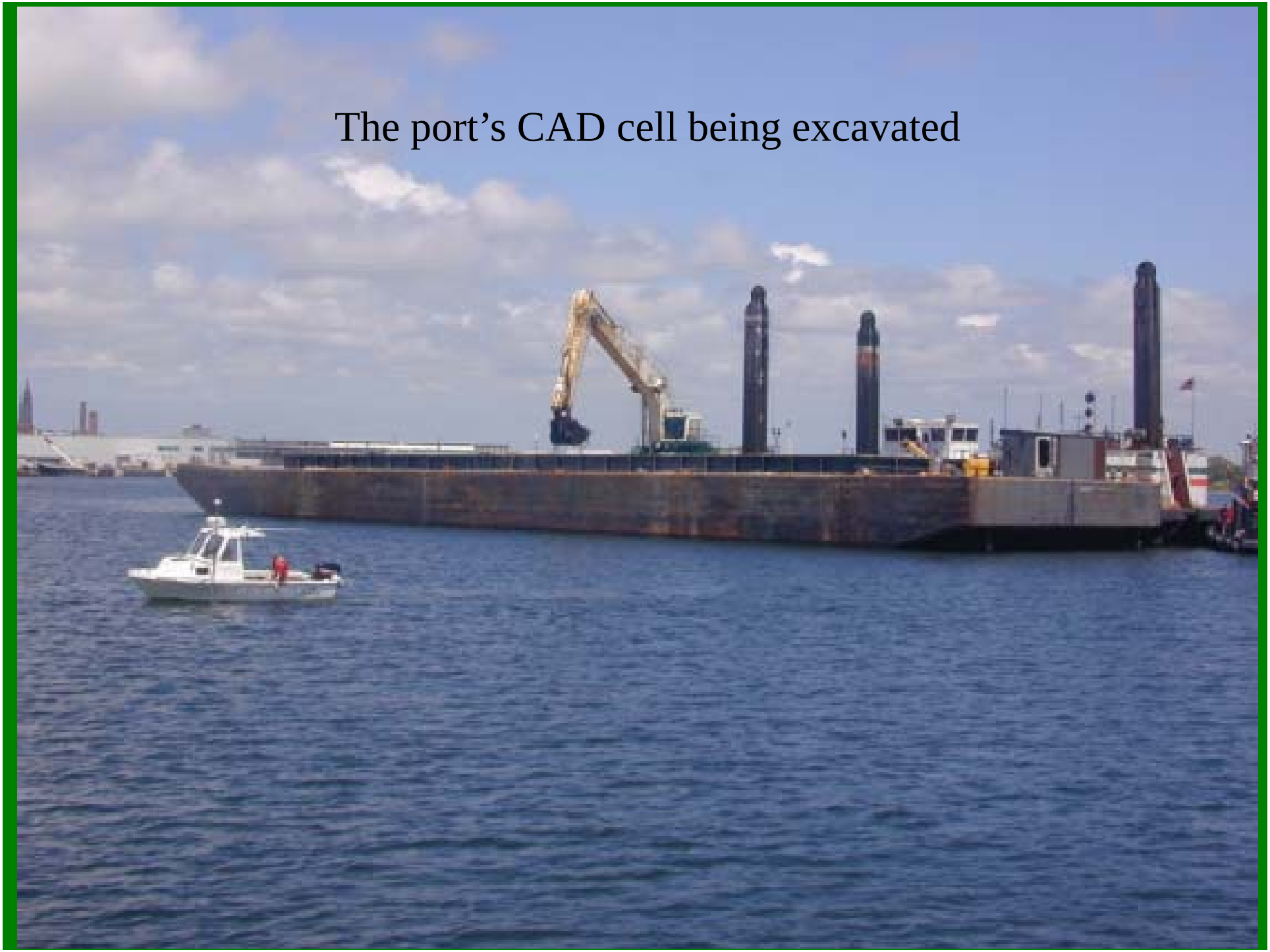


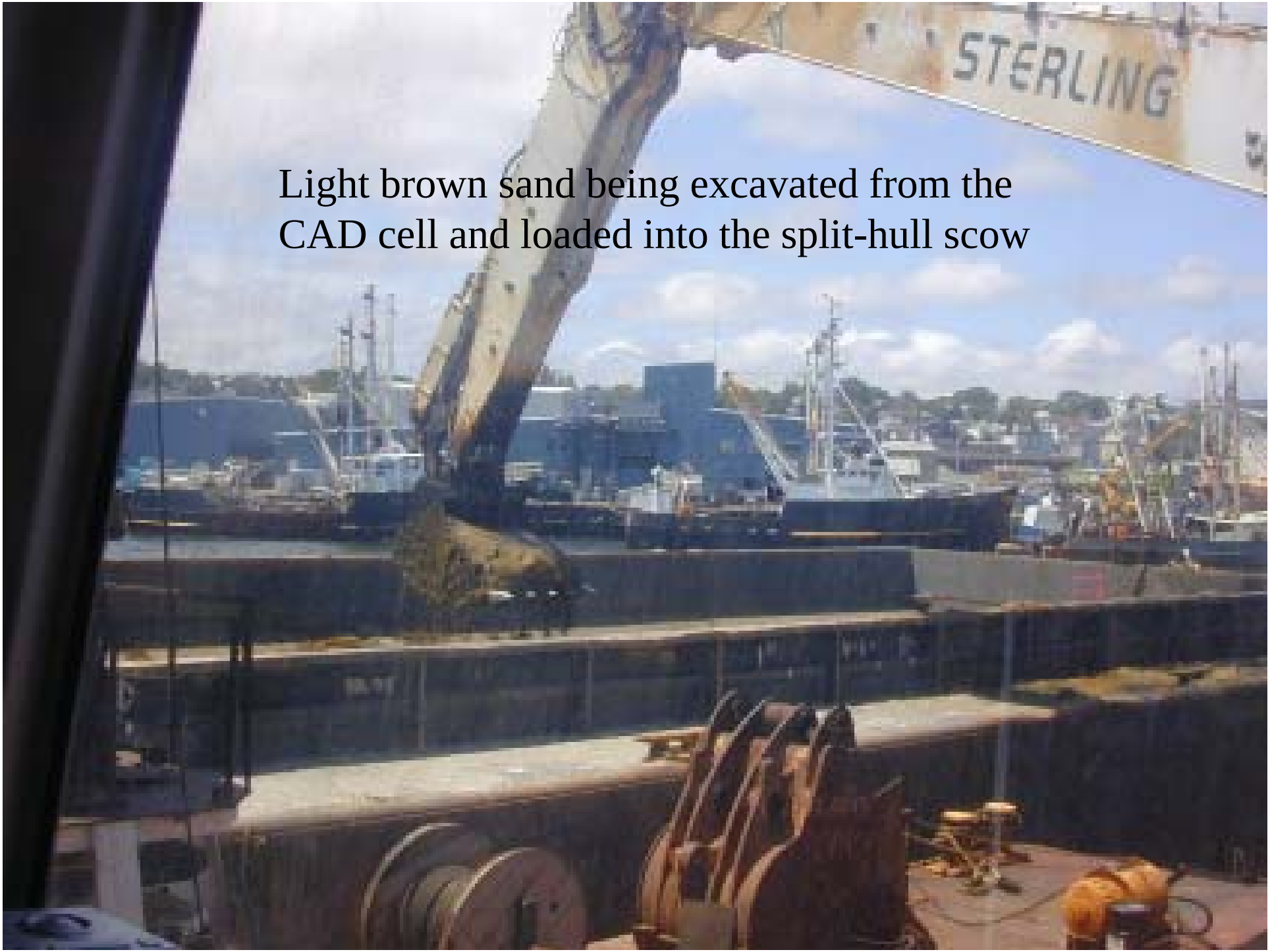

**Step 4:** clean sand is placed as a final cap.

So…a flip flop:


BEFORE


AFTER


The port’s CAD cell being excavated

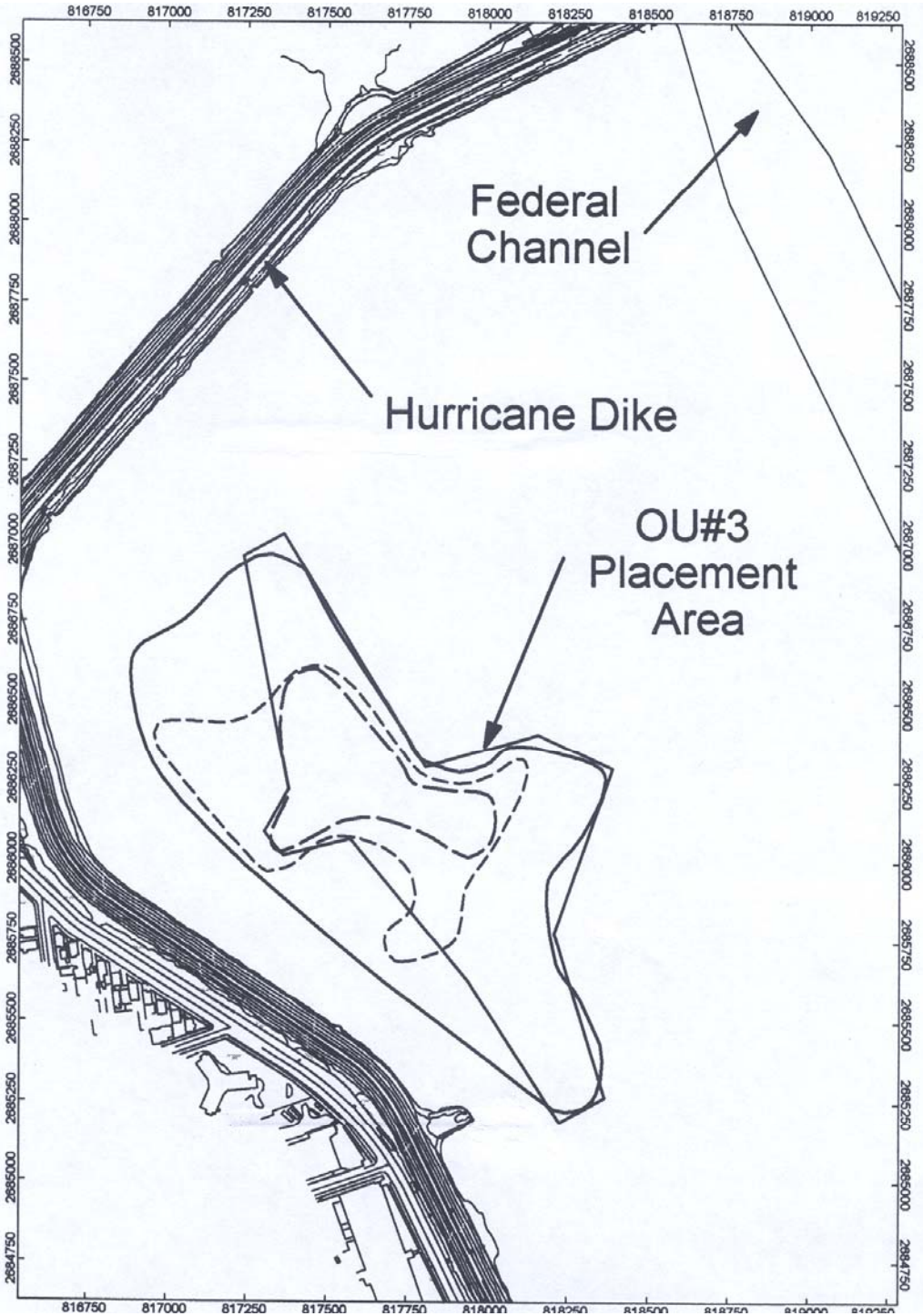



Light brown sand being excavated from the CAD cell and loaded into the split-hull scow

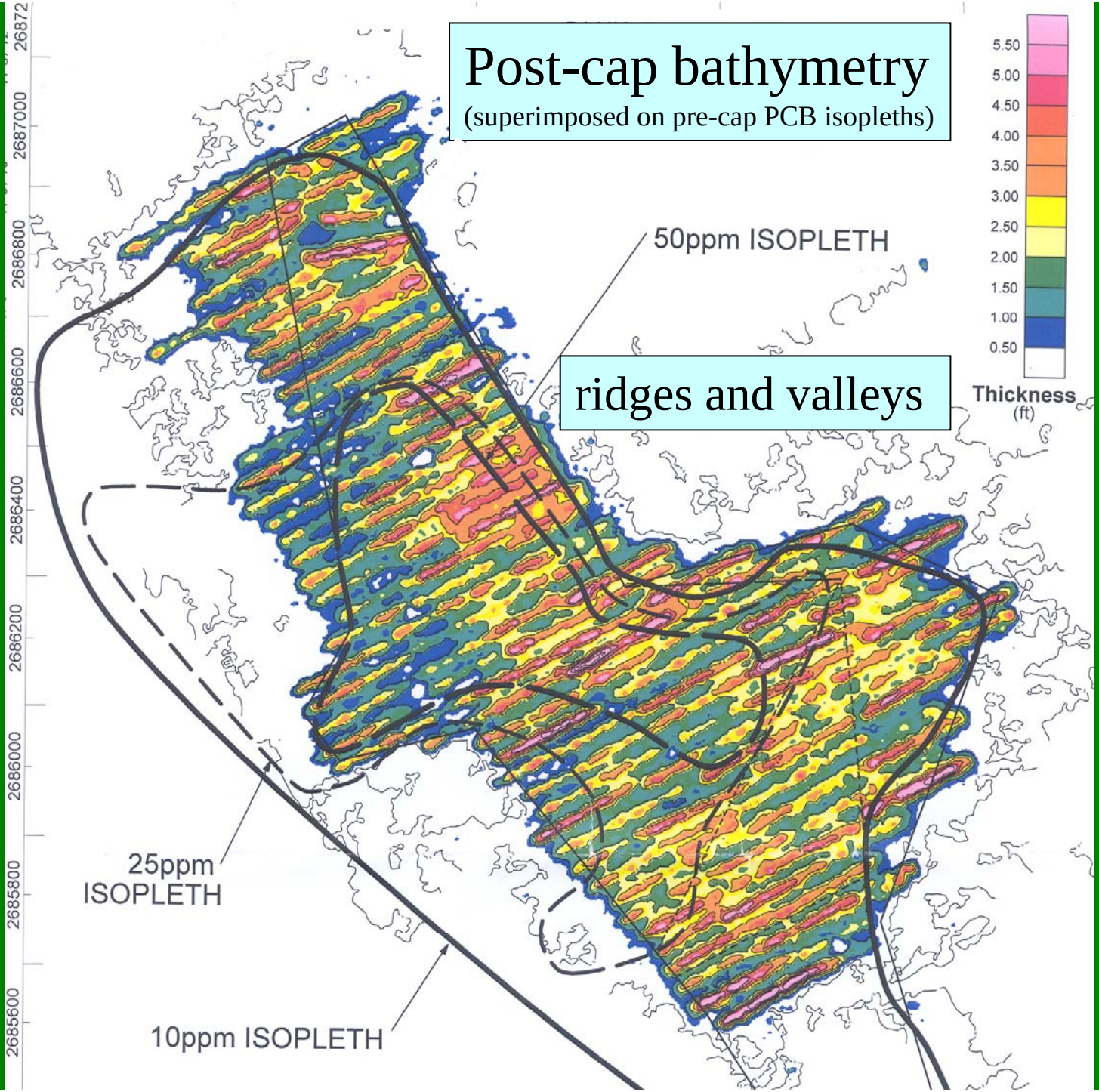

The split-hull scow in position at the cap site; just starting to open.
07/10/2005 09:33:01

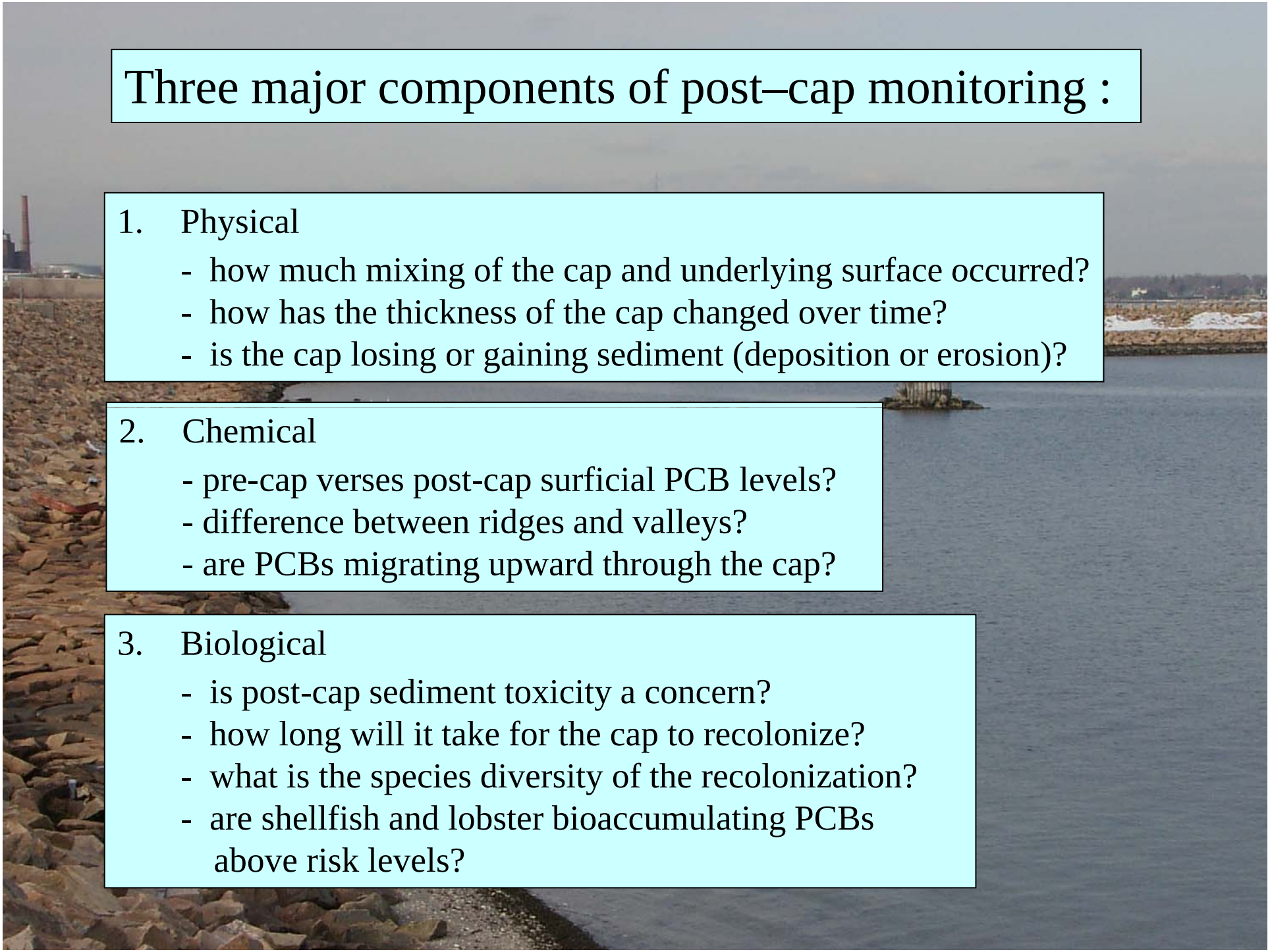
# The New Bedford Harbor Superfund Site

## III. Post-cap monitoring to date




The pilot cap area in context


Post-cap bathymetry
(superimposed on pre-cap PCB isopleths)
ridges and valleys
50ppm ISOPLETH
25ppm ISOPLETH
10ppm ISOPLETH
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
Thickness (ft)
2687000
2686800
2686600
2686400
2686200
2686000
2685800
2685600



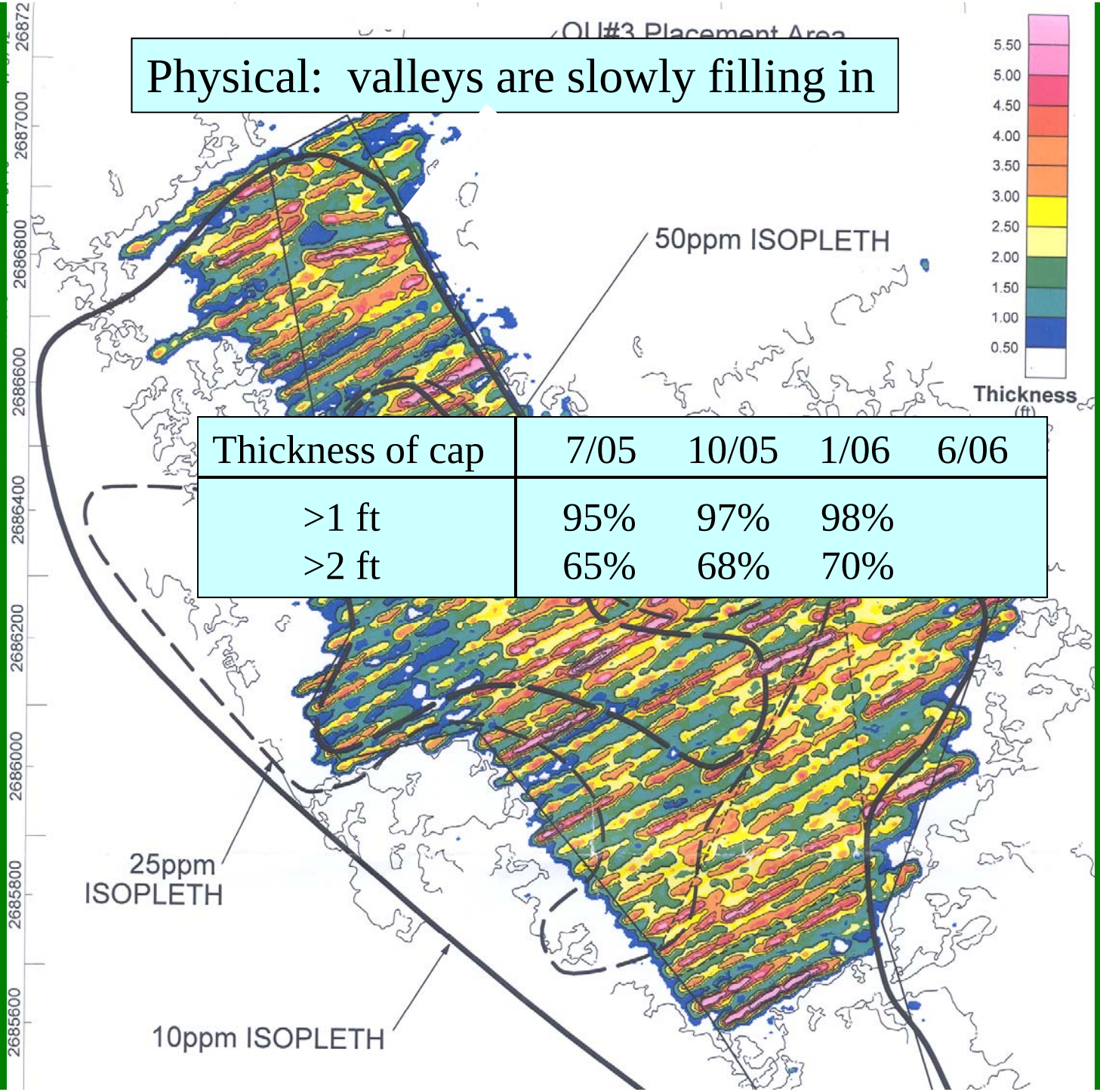
# Three major components of post–cap monitoring :

1. Physical
   - how much mixing of the cap and underlying surface occurred?
   - how has the thickness of the cap changed over time?
   - is the cap losing or gaining sediment (deposition or erosion)?

2. Chemical
   - pre-cap verses post-cap surficial PCB levels?
   - difference between ridges and valleys?
   - are PCBs migrating upward through the cap?

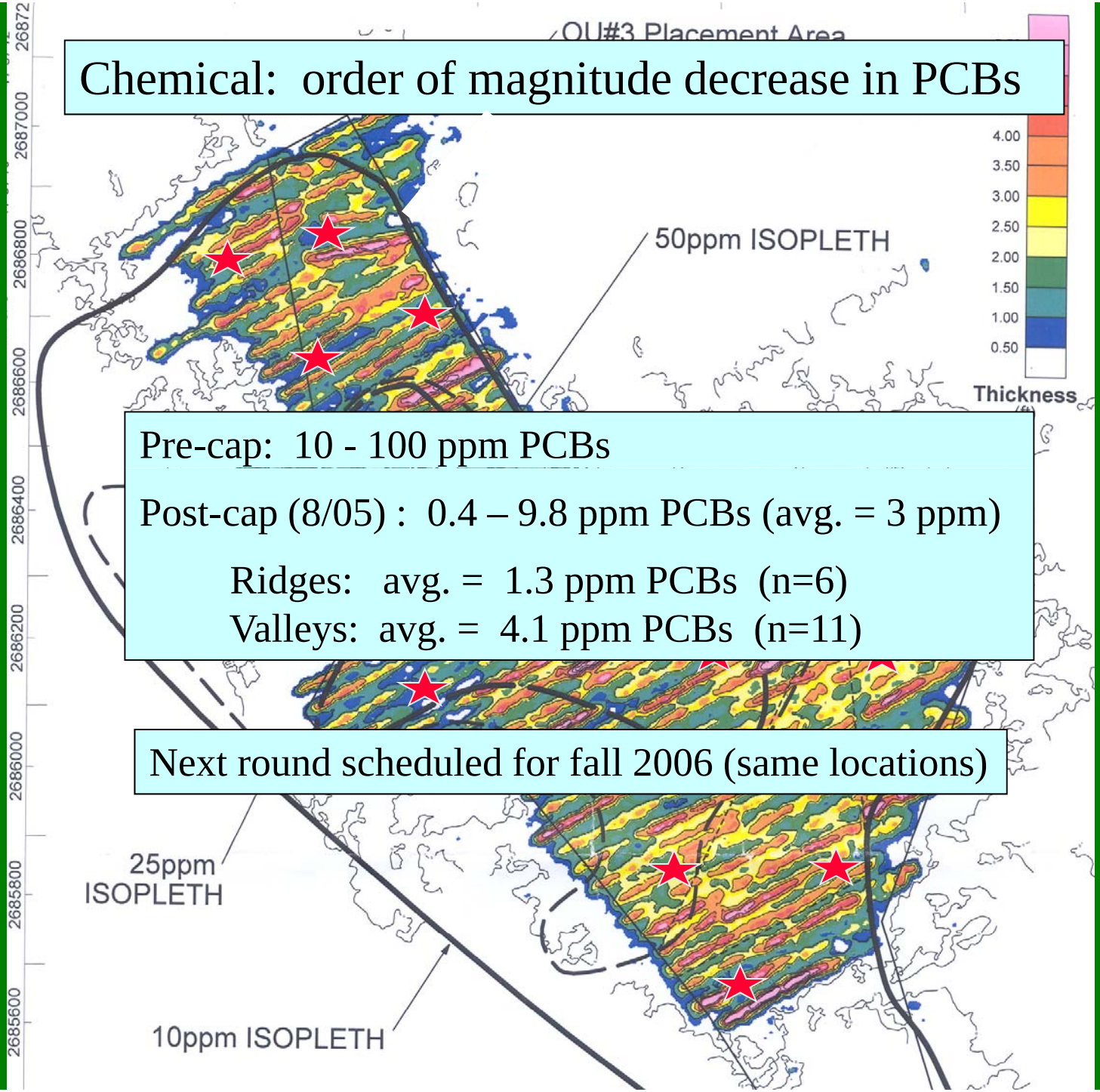
3. Biological
   - is post-cap sediment toxicity a concern?
   - how long will it take for the cap to recolonize?
   - what is the species diversity of the recolonization?
   - are shellfish and lobster bioaccumulating PCBs above risk levels?

# Physical: valleys are slowly filling in




| Thickness of cap | 7/05 | 10/05 | 1/06 | 6/06 |
|---|---|---|---|---|
| >1 ft | 95% | 97% | 98% | |
| >2 ft | 65% | 68% | 70% | |

# Chemical: order of magnitude decrease in PCBs




Pre-cap: 10 - 100 ppm PCBs

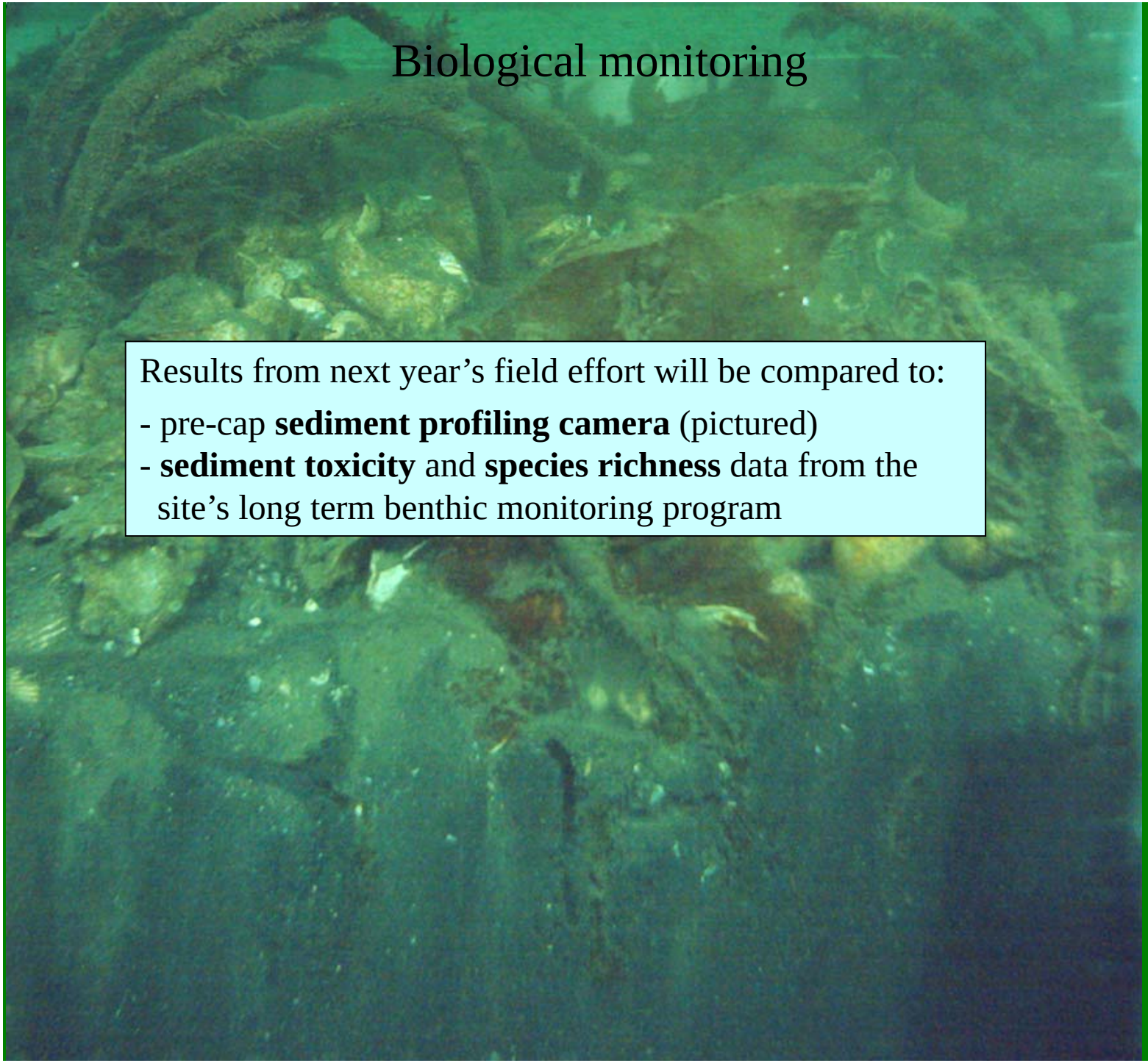
Post-cap (8/05) : 0.4 – 9.8 ppm PCBs (avg. = 3 ppm)

Ridges: avg. = 1.3 ppm PCBs (n=6)
Valleys: avg. = 4.1 ppm PCBs (n=11)

Next round scheduled for fall 2006 (same locations)

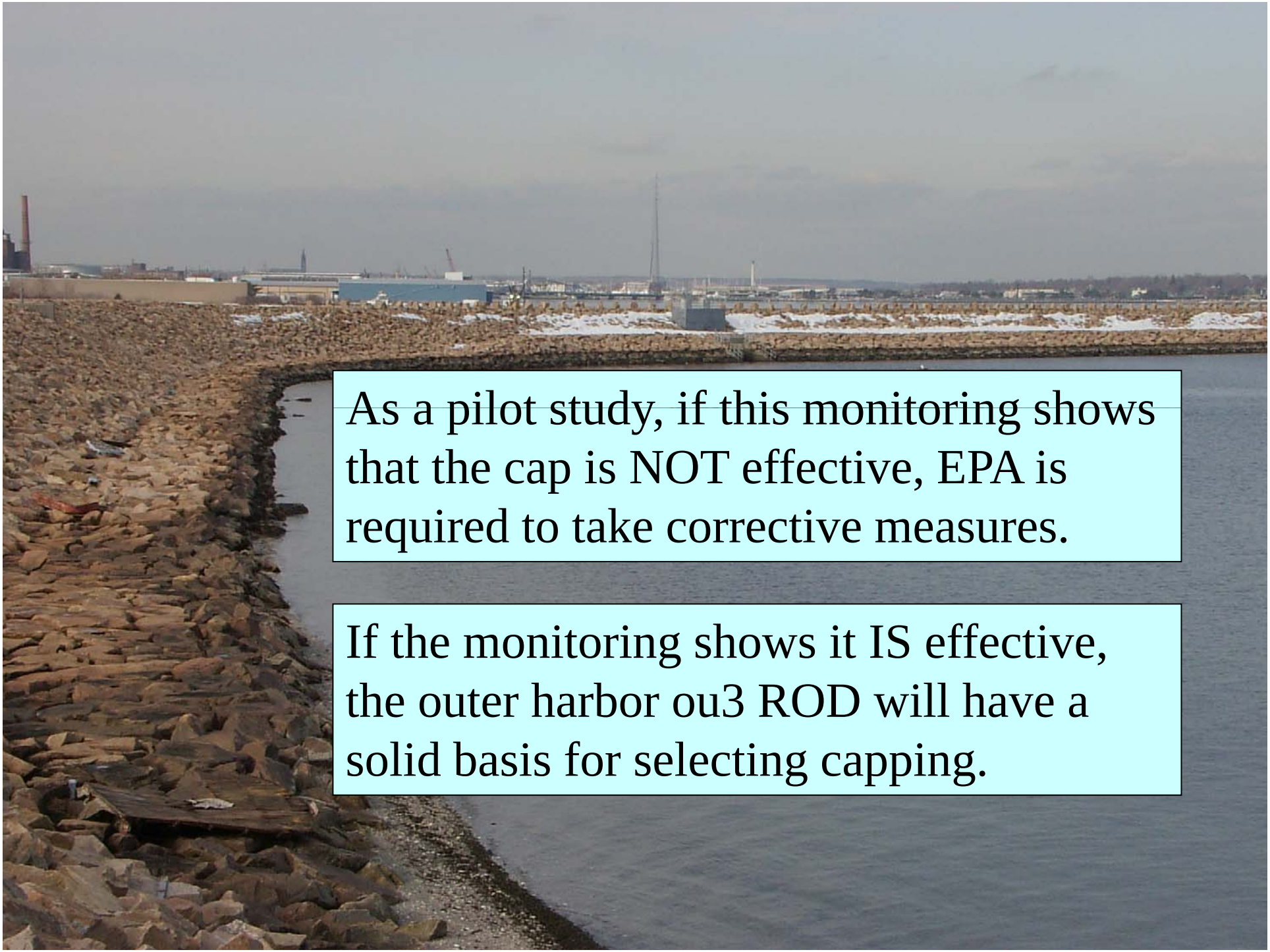
★ = post-cap sediment sampling location

# Biological monitoring



Results from next year's field effort will be compared to:

- pre-cap **sediment profiling camera** (pictured)
- **sediment toxicity** and **species richness** data from the site's long term benthic monitoring program


As a pilot study, if this monitoring shows that the cap is NOT effective, EPA is required to take corrective measures.
If the monitoring shows it IS effective, the outer harbor ou3 ROD will have a solid basis for selecting capping.


By the way….
The port's navigational dredging and CAD cell were done as a "state enhanced remedy" (CFR 40 CFR 300.515(f)), including the permit exemption provisions of the NCP.
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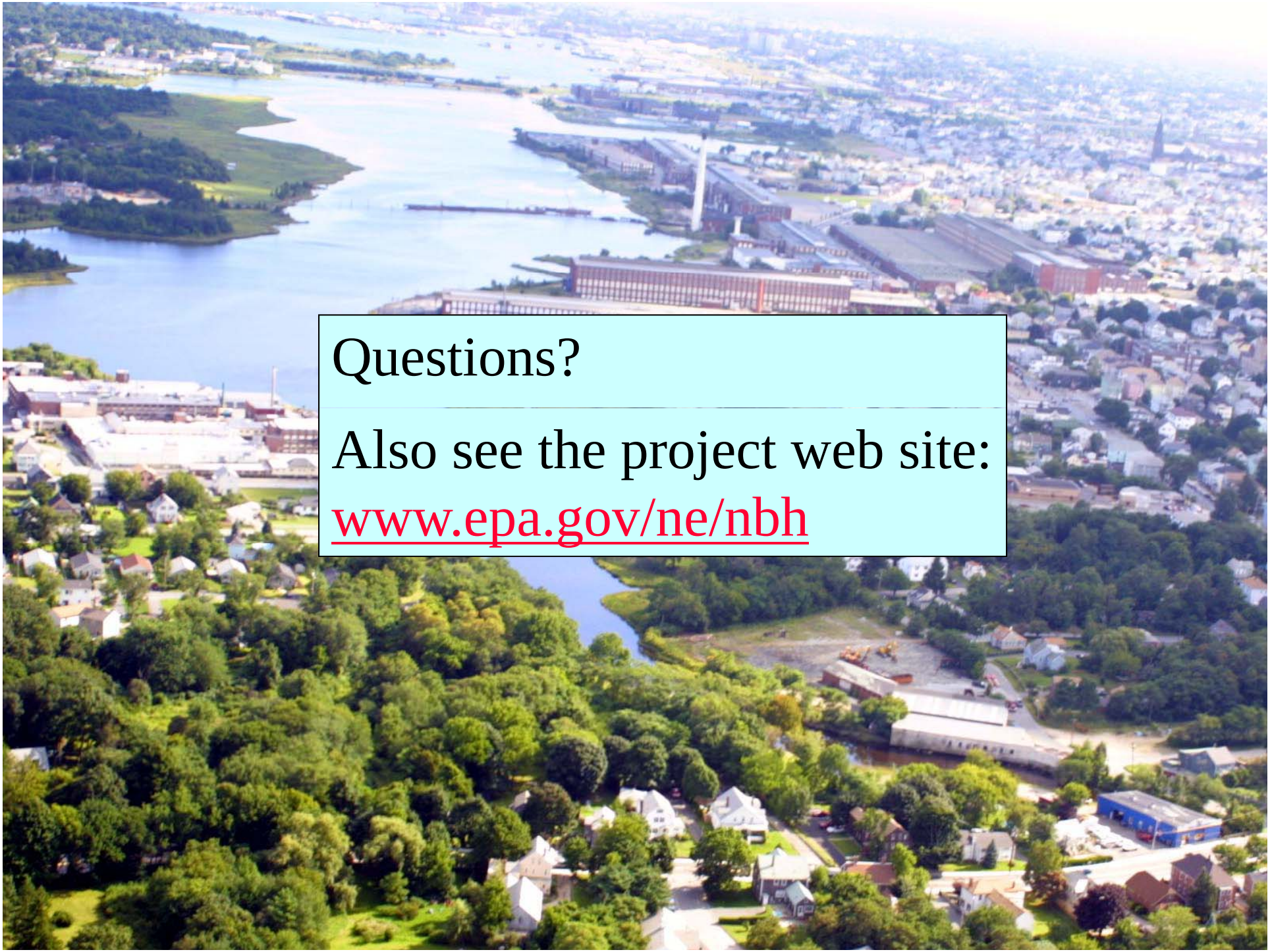
Questions?
Also see the project web site:
www.epa.gov/ne/nbh